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We Claim:

1   1.   Apparatus for processing a signal comprising:

2   a coder for generating at least first and second

3   representations of the signal, the first and second

4   representations being different from each other; and

5   a controller for packaging at least one of the

6   first and second representations into a plurality of

7   packets, each packet including at least an indicator, and an

8   information content derived from one of the first and second

9   representations, the indictor identifying the representation

10   from which the information content is derived.

1   2.   The apparatus of claim 1 wherein the plurality

2   of packets include at least first and second sequences of

3   packets, the indicator in each packet in the first sequence

4   identifying the first representation, and the indicator in

5   each packet in the second sequence identifying the second

6   representation.

1   3.   The apparatus of claim 2 wherein the signal is

2   processed on a time-segment basis, each time segment being

3   associated with a different packet in the first sequence and

4   another different packet in the second sequence.

1   4.   The apparatus of claim 3 wherein each packet

2   also includes a second indicator identifying the time

3   segment with which the packet is associated.

1   5.   The apparatus of claim 1 wherein the signal

2   contains audio information,

1   6.   The apparatus of claim 5 wherein the signal is
2   encoded in accordance with a perceptual audio coding (PAC)
3   technique.

1   7.   The apparatus of claim 1 wherein the signal
2   comprises a plurality of frequency components, the first
3   representation being derived from a first subset of the
4   frequency components, and the second representation being
5   derived from a second subset of the frequency components.

1   8.   The apparatus of claim 7 wherein the first
2   subset of the frequency components is identical to the
3   second subset of the frequency components.

1   9.   The apparatus of claim 8 wherein the first
2   representation is derived using a first quantizer, and the
3   second representation is derived using a second quantizer,
4   the first and second quantizers being complementary to each
5   other.

1   10. The apparatus of claim 7 wherein the first
2   subset of the frequency components is different from the
3   second subset of the frequency components, the first
4   representation providing a description of the signal, the
5   second representation providing enhancement to the
6   description.

1   11. The apparatus of claim 1 wherein the first
2   and second representations are delivered at different rates.

1   12. The apparatus of claim 2 wherein the first
2   sequence of packets and the second sequence of packets are

3   provided at different times.

1   13. The apparatus of claim 1 wherein the first
2   sequence of packets and the second sequence of packets are
3   provided via different communication paths.

1   14. Apparatus for providing at least first and
2   second representations of a signal, the first representation
3   being different from the second representation, the
4   apparatus comprising:
5   a first quantizer for quantizing at least a
6   portion of the signal in accordance with a first
7   multidimensional lattice to generate the first
8   representation; and
9   a second quantizer for quantizing at least the
10   portion of the signal in accordance with a second, different
11   multidimensional lattice to generate the second
12   representation, the first quantizer and the second quantizer
13   being complementary to each other.

1   15. The apparatus of claim 14 wherein at least
2   one of the first and second multidimensional lattices
3   include a plurality of cells, at least two of the cells
4   being different from each other.

1   16. The apparatus of claim 14 wherein the signal
2   includes a plurality of frequency components and the portion
3   of the signal includes a subset of the plurality of
4   frequency components.

1   17. The apparatus of claim 14 wherein the signal
2   contains audio information.

1   18.   The apparatus of claim 17 wherein the signal
2 is encoded in accordance with a PAC technique.

1   19.   Apparatus for recovering a signal comprising:
2   an interface for receiving a plurality of packets,
3 each packet including an indicator, and an information
4 content derived from one of a plurality of representations
5 of the signal, the indicator identifying the representation
6 from which the information content is derived, the plurality
7 of representations being different from one another; and
8   a processor responsive to the received packets for
9 recovering the signal.

1   20.   The apparatus of claim 19 wherein the
2 interface also receives information concerning the number of
3 representations.

4   21.   The apparatus of claim 19 wherein the
5 plurality of packets include at least first and second
6 sequences of packets, and the plurality of representations
7 include at least first and second representations, the
8 indicator in each packet in the first sequence identifying
9 the first representation, and the indicator in each packet
10 in the second sequence identifying the second
11 representation.

1   22.   The apparatus of claim 21 wherein the signal
2 is recovered on a time-segment basis, each time segment
3 being associated with a different packet in the first
4 sequence and another different packet in the second
5 sequence.

1   23.   The apparatus of claim 22 wherein each packet
2   also includes a second indicator identifying the time
3   segment with which the packet is associated.

1   24.   The apparatus of claim 22 wherein the first
2   representation provides a description of the signal, and the
3   second representation provides enhancement to the
4   description.

1   25.   The apparatus of claim 24 wherein the
2   processor performs concealment for a time segment in
3   recovering the signal when the packet in the first sequence
4   associated with the time segment is not received within a
5   predetermined period.

1   26.   The apparatus of claim 19 wherein the signal
2   contains audio information.

1   27.   The apparatus of claim 26 wherein the signal
2   is encoded in accordance with a PAC technique.

1   28.   A method for processing a signal comprising:
2   generating at least first and second
3   representations of the signal, the first and second
4   representations being different from each other; and
5   packaging at least one of the first and second
6   representations into a plurality of packets, each packet
7   including at least an indicator, and an information content
8   derived from one of the first and second representations,
9   the indictor identifying the representation from which the
10 information content is derived.

1   29.   The method of claim 28 wherein the plurality
2 of packets include at least first and second sequences of
3 packets, the indicator in each packet in the first sequence
4 identifying the first representation, and the indicator in
5 each packet in the second sequence identifying the second
6 representation.

1   30.   The method of claim 29 wherein the signal is
2 processed on a time-segment basis, each time segment being
3 associated with a different packet in the first sequence and
4 another different packet in the second sequence.

1   31.   The method of claim 30 wherein each packet
2 also includes a second indicator identifying the time
3 segment with which the packet is associated.

1   32.   The method of claim 28 wherein the signal
2 contains audio information.

1   33.   The method of claim 32 wherein the signal is
2 encoded in accordance with a PAC technique.

1   34.   The method of claim 28 wherein the signal
2 comprises a plurality of frequency components, the first
3 representation being derived from a first subset of the
4 frequency components, and the second representation being
5 derived from a second subset of the frequency components.

1   35.   The method of claim 34 wherein the first
2 subset of the frequency components is identical to the
3 second subset of the frequency components.

1   36.   The method of claim 35 wherein the first
2   representation is derived using a first quantizer, and the
3   second representation is derived using a second quantizer,
4   the first and second quantizers being complementary to each
5   other.

1   37.   The method of claim 34 wherein the first
2   subset of the frequency components is different from the
3   second subset of the frequency components, the first
4   representation providing a description of the signal, the
5   second representation providing enhancement to the
6   description.

1   38.   The method of claim 28 wherein the first and
2   second representations are delivered at different rates.

1   39.   The method of claim 29 wherein the first
2   sequence of packets and the second sequence of packets are
3   provided at different times.

1   40.   The method of claim 29 wherein the first
2   sequence of packets and the second sequence of packets are
3   provided via different communication paths.

1   41.   A method for use in an apparatus for
2   providing at least first and second representations of a
3   signal, the first representation being different from the
4   second representation, the apparatus including a first
5   quantizer and a second quantizer, the first quantizer and
6   the second quantizer being complementary to each other, the
7   method comprising:
8   quantizing at least a portion of the signal using

9   the first quantizer in accordance with a first

10 multidimensional lattice to generate the first

11 representation; and

12   quantizing at least the portion of the signal

13 using the second quantizer in accordance with a second,

14 different multidimensional lattice to generate the second

15 representation.

1   42.   The method of claim 41 wherein at least one

2   of the first and second multidimensional lattices include a

3   plurality of cells, at least two of the cells being

4   different from each other.

1   43.   The method of claim 41 wherein the signal

2   includes a plurality of frequency components and the portion

3   of the signal includes a subset of the plurality of

4   frequency components.

1   44.   The method of claim 41 wherein the signal

2   contains audio information.

1   45.   The method of claim 44 wherein the signal is

2   encoded in accordance with a PAC technique.

1   46.   A method for recovering a signal comprising:

2   receiving a plurality of packets, each packet

3   including an indicator, and an information content derived

4   from one of a plurality of representations of the signal,

5   the indicator identifying the representation from which the

6   information content is derived, the plurality of

7   representations being different from one another; and

8   recovering the signal in response to the received

9   packets.

1   47.   The method of claim 46 further comprising
2   receiving information concerning the number of
3   representations.

4   48.   The method of claim 46 wherein the plurality
5   of packets include at least first and second sequences of
6   packets, and the plurality of representations include at
7   least first and second representations, the indicator in
8   each packet in the first sequence identifying the first
9   representation, and the indicator in each packet in the
10 second sequence identifying the second representation.

1   49.   The method of claim 48 wherein the signal is
2   recovered on a time-segment basis, each time segment being
3   associated with a different packet in the first sequence and
4   another different packet in the second sequence.

1   50.   The method of claim 49 wherein each packet
2   also includes a second indicator identifying the time
3   segment with which the packet is associated.

1   51.   The method of claim 49 wherein the first
2   representation provides a description of the signal, and the
3   second representation provides enhancement to the
4   description.

1   52.   The method of claim 51 further comprising
2   performing concealment for a time segment in recovering the
3   signal when the packet in the first sequence associated with
4   the time segment is not received within a predetermined

5   period.

1   53.   The method of claim 46 wherein the signal
2   contains audio information.

1   54.   The method of claim 53 wherein the signal is
2   encoded in accordance with a PAC technique.